Patent Application of

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For

TITLE: ARTIFICIAL HEART POWER AND CONTROL SYSTEM

ABSTRACT OF THE INVENTION

The present invention provides a human engineered power and control system for artificial hearts or assist devices configured for ease of use, ruggedness, and high reliability. Battery powered systems of the prior art have required multiple cables and connectors that are subject to failure due to damage or wear. In the present invention, direct connection of the batteries to the control system eliminates multiple cables and connectors used with previous designs. A novel method of connecting batteries to the control system and exchanging batteries without interruption of power is provided in a compact user friendly configuration. The control system may provide periodic reductions in assist device flow to permit the natural ventricle to eject blood through the natural outflow valve, open the valve leaflets to prevent them from adhering together, and achieve sufficient washout to prevent thrombosis. Using either software based control or software independent electronic circuitry, the flow pumped by the artificial heart is reduced for a long enough period of time to permit at least a few beats of the natural heart to generate sufficient pressure to open the outflow valve. In a control system embodiment in which the patient manually adjusts the pump speed to incremental settings for rest and exercise conditions, a pulsatile flow mode is disclosed which provides approximately the same flow at a given incremental setting as the pump produces when running in a constant speed mode at the same setting. As the patient learns which speed setting is best for daily activities, the patient may use the same setting with either a pulsatile or constant pump speed mode.